GOVERNMENT OF INDIA
ATOMIC ENERGY
LOK SABHA

UNSTARRED QUESTION NO:403
ANSWERED ON:22.02.2006
THORIUM EXTRACTION AND USE
Singh Shri Mohan

Will the Minister of ATOMIC ENERGY be pleased to state:

(a) whether the Bhabha Atomic Research Centre (BARC) has found an alternative of uranium in the field of production of atomic energy;

(b) if so, the details thereof;

(c) whether the Government proposes to lay emphasis on the research work related to thorium as an alternative of Uranium;

(d) whether thorium is adequately available in the country;

(e) if so, whether the Government has formulated any scheme /programme to develop atomic energy on the basis of its use; and

(f) if so, the details thereof?

Answer

THE MINISTER OF STATE IN THE PRIME MINISTER`S OFFICE (SHRI PRITHVIRAJ CHAVAN):

(a) Yes, Sir. Uranium 235 is the only naturally occurring fissile material, which can be used or production of nuclear energy. Plutonium 239 and Uranium 233 are the two man made fissile materials, which can also be used for production of nuclear energy. Presently reactors operated by the Department of Atomic Energy (DAE) are fuelled by natural Uranium. DAE is constructing 500 MWe fast reactor at Kalpakkam which will utilise plutonium 239 as fuel. In the third stage of nuclear power programme, the DAE have plans for using Uranium 233 as fuel.

(b) The Bhabha Atomic Research Centre (BARC) has a mandate for the development of approaches for utilization of Thorium for power generation. It is currently working on the design and development of an Advanced Heavy Water Reactor, which would produce nearly two-third of its power from Thorium. This reactor will require Plutonium as fissile fuel input. BARC is also actively working on the development of different techniques for the manufacture of nuclear fuel bearing Thorium and also its reprocessing. In the past, several studies were carried out for use of Thorium in our Pressurised Heavy Water Reactors.

(c) Yes, Sir. BARC proposes to lay emphasis on the research work related to Thorium.

(d) Yes, Sir. Thorium is adequately available in the country.

(e) Yes, Sir.

(f) Uranium is the only naturally occurring source of fissile material and it is necessary to start any new nuclear power programme. In order to multiply the fissile material resource available for growth of nuclear power programme, DAE have adopted use of natural Uranium fuelled Pressurised Heavy Water Reactors in the first stage. Plutonium recovered from the spent fuel of these reactors will be used to serve as the fissile fuel for the second stage comprising Fast Breeder Reactors. Naturally occurring Thorium, which does not have any fissile component, can be irradiated in these fast breeder reactors to produce Uranium-233, a man made fissile material. In the third stage of Indian nuclear power programme, Thorium together with Uranium-233 produced in Fast Breeder Reactors will be used to generate power on a large scale to ensure long-term energy security in the country.